TITLE: DUAL EYE MOTION DETECTOR ASSEMBLY

This is a utility patent application based on a provisional patent application (Serial No. 60/224,860) filed on August 11, 2000.

BACKGROUND OF THE INVENTION

1. Field of the Invention:

This invention pertains to motion detectors and, more particularly to motion detectors with adjustable wide viewing areas.

2. Description of the Related Art:

Motion detector lighting controls that include an infrared sensor box and a pair of lamp holders, all rotatably mounted to a mounting box, have been known for years. When an infrared emitting object, such as an animal, enters the viewing zone of the infrared sensor,

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floodlight, mounted on an adjacent wall, when an object enters the walkway from either end. Since an object may enter the walkway from either end, a wide-angle detector must be aimed at the middle axis between the two ends so that motion at each end of the walkway is detected. Motion detection near or along the middle axis is not necessary. In other instances, it may be desirable to exclude a middle section of the wide coverage from detection.

Another drawback with single, wide-angle motion detectors is that their viewing fields have uniform height or depth. The heights or depths of sections in their viewing fields cannot be selectively adjusted. Such an adjustment feature would be desirable, for example, when detecting movement in a stairway or its lower landing area.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a motion detector assembly with adjustable wide viewing area.

It is another object of the present invention to provide such a motion detector assembly in which the arc and height of selected sections of the viewing areas may be independently adjusted by the user.

It is a further object of the invention to provide such a motion detector assembly that is less likely to fail over time due to dirty or fogged conditions.

These and other objects of the invention which will become apparent are met by an improved dual head motion detector assembly comprising an independently adjustable main

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motion sensor head and an independently adjustable secondary motion sensor head both pivotally mounted to a mounting box. Both the main motion sensor head and the secondary motion sensor head contain standard infrared motion sensors, each with an approximate 110-degree viewing zone. The two motion sensors are both connected to a control panel located in the main motion sensor head with on/off switch and sensitivity control switches externally mounted thereto. The control panel is connected between at least one lamp socket and an outside 110-volt electric circuit. When an infrared-emitting object passes into one or both viewing zones of the two motion sensors, the circuit between the control panel and the lamp socket opens thereby activating the bulb connected to the lamp socket.

When a wide, combined viewing area is desired, the main and secondary motion sensor heads are pivotally adjusted on the mounting box so that their separate viewing zones slightly overlap thereby providing a total coverage zone of approximately 330 degrees. The main and secondary motion sensor heads may be independently twisted towards their desired viewing areas and independently elevated to obtain different viewing area depths. Also, both the main and secondary motion sensor heads use single lens infrared sensors rather than multiple lens or mirror sensors thereby making them less susceptible to dirt or fog.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of the dual eye motion detector assembly with lamps attached thereto.

Fig. 2 is a front elevational view of the invention.

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Fig. 3 is a rear elevational view of the invention.

Fig. 4 is a top plan view of the invention.

Fig. 5 is a bottom plan view of the invention.

Fig. 6 is a left side elevational view of the invention.

Fig. 7 is a right side elevational view of the invention.

Fig. 8 is a top plan view of the assembly illustrating the motion sensor heads being horizontally adjusted to change the arc of coverage.

Fig. 9 is a side elevation view of the assembly showing the motion sensor heads tilted at different angles to change the depth of field coverage.

DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Referring to the accompanying Figs. 1 - 9, there is shown and described a dual eye motion detector assembly 10 comprising a main motion sensor head 40 and a secondary motion sensor head 50 both mounted on a mounting box 20. Located inside the main motion sensor head 40 and the secondary motion sensor head 50 are standard, single-lens motion sensors 60, 60' respectively, each designed to provide an approximate 110-degree viewing zone, as shown in Fig. 8. Both the main motion sensor head 40 and secondary motion sensor head 50 are pivotally mounted to rigid arms 34, 36, respectively, that are connected to vertically aligned, rotatably adjusted posts 30, 32, respectively, that extend downward from the bottom surface 22 mounting box 20.

In the preferred embodiment, the mounting box 20 is a five-sided structure with a flat

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mounting plate 21 selectively attached over its rear opening 25. The bottom surface 22 of the mounting box 20 is flat and horizontally aligned and opposite a flat, diagonally aligned top surface 23. The two opposite sides surfaces 24, 26 are diagonally aligned and converge towards a flat, vertically aligned front surface. 27. Two holes (not shown) are evenly spaced apart and formed on the bottom surface 22 which connect to the proximal ends of the two posts 30, 32. Formed on each side surface, 24, 26 is a centrally aligned hole 25, 28, respectively, which connects to the arm 72, 82 on a standard light fixture 70, 80, respectively.

The main and secondary motion sensor heads 40, 50 both include a hollow, spherical housing 42, 52 with the arms 34, 36, respectively, attached to their rear surfaces. Front openings 44, 54, are formed on the housings 42, 52, in which transparent lens 46, 49, respectively, are placed. Suitable threaded connectors 38 are used to attach the distal ends of the arms 34, 36 to the ends of the posts 30, 32, respectively.

As shown in Figs. 3 and 5, attached to the bottom surface 22 of the main motion sensor head 40 is a on/off switch 62 and sensitivity control buttons 64, 66 all connected to a printed circuit panel 55 also located in the sensor head 40. Five wires 56-59, 68, extend from the circuit panel 55 through the arms 34, 36 and into the mounting box 20. During installation, a black wire 93, green wire 92, and a ground wire 91 connected at one end to the main electrical circuit of the building are extended into the mounting box 20. The ground wire 91 connects to the side of the mounting box 20. The green wire 92 connects to the two wires 78, 87 that extend from the two light fixtures 70, 80 and to the second main power wire 57 from the circuit panel 55. A common wire 61 from the circuit panel 55 connects to

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common wires 77, 88 from the first and second light fixture 70, 80, respectively. The black wire 93 connects to a first main power wire 56 that extend from the circuit panel 55. The two wires 58', 59' from the secondary motion sensor 50 connect to two wires 58, 59 extending from the circuit panel 55.

The motion sensors 60, 60' used in each sensor head 40, 50 are standard passive infrared sensors that provide approximately 90 to 180 degree coverage.

The main circuit panel 55 may be connected to two light fixtures 70, 80 or one light fixture (not shown) so that when an object is detected in one of the viewing fields of the motion sensors 60, 60', both lamps are activated. It should be understood, that the circuit panel 55 could be electrically connected so that each motion sensor head 40, 50 operates one light fixture 70 or 80.

As shown in Fig. 8, during assembly, the motion sensor heads 40, 50 are pivotally adjusted on the mounting box 20 so that their respective view zones overlap approximately 20 degrees. The total view zone of both motion sensor heads 40, 50 is approximately 270 to 330 degrees thereby enabling the lamps to be automatically activated by objects approaching the motion sensors from the side or behind. Each motion sensor head 40, 50 can be elevated upward or downward approximately 30 degrees from the horizontal axis thereby enabling the height of the viewing field to be adjusted. Because each motion sensor head 40, 50 uses a standard, passive motion sensor 60, 60' without inclined mirror faces, the problem associated with dirty or fogged surfaces is not present.

In compliance with the statute, the invention described herein has been described in

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language more or less specific as to structural features. It should be understood, however, that the invention is not limited to the specific features shown, since the means and construction shown, comprised only of the preferred embodiments for putting the invention into effect. The invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the amended claims, appropriately interpreted in accordance with the doctrine of equivalents.

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